which exactly simulate each other, one electrical and the other material; and those who hold this as a reasonable possibility are careful to speak of electrons as 'corpuscles,' meaning charged particles of matter of extremely small size, much smaller than an atom, consisting of a definite electric charge and an unknown material nucleus; which nucleus, as they recognize, but have not yet finally proved, may quite possibly be zero."

The only essential and constant difference between living and non-living matter is that within the molecules of the former there is constant metabolism, while in the latter no such process occurs. We are to conceive of the living molecule as made up of numerous atoms and each atom surrounded by its electrons: atoms and electrons in ceaseless motion, and groups of atoms being constantly cast out of the molecule and replaced by new groups split off from matter outside the molecule. As soon as a molecule becomes the seat of assimilation and excretion, it is no longer dead, it lives. As a result of assimilation it acquires the property of building up its own tissue; then polymerization follows and reproduction in its simplest form begins. The one phenomenon always manifested by living matter, and never exhibited by non-living matter, is metabolism. Verworm says: "Vital motion, metabolism, is a complex motion very strongly characterizing the living organism; it consists in the continual self-decomposition of living substance, the giving off to the outside of the decomposition products, and, in return, the taking in from the outside of certain substances which give to the organism the material with which to regenerate itself and grow by the formation of similar groups of atoms, *i.e.*, by polymerization. This is characteristic of all living substance."

I have promised to give you some of the *new* conceptions of the living cell, and yet I must admit that Aristotle apparently recognized that metabolism is the one characteristic of living matter, for he says: "Life is the assemblage of the operations of nutrition, growth and destruction." Of course, this Greek philosopher did not know about cells, molecules, atoms and electrons what is to-day known, but it must be acknowledged that he had a clear conception of the most essential characteristics of living matter. Herbert Spencer has given three definitions of life, and either may be applied to the conception which I am trying to present to you. The first is: "Life is the co-ordination of atoms." The co-ordination between assimilation and excretion is certainly essential to life, and failure of this co-ordination leads to death. The second is probably the best definition of life ever given, and fits our conception perfectly. It is: "Life is the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external coexistences and sequences." The third is practically the same as the second,